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10/758,610	01/15/2004	Jim L. Wong	7784-000222DVA	6155

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EXAMINER
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TSOY, ELENA

ART UNIT	PAPER NUMBER
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1762

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07/20/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/758,610

Applicant(s)

WONG ET AL.

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-17 and 19-26 is/are pending in the application.
- 4a) Of the above claim(s) 22-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-17, 19-21 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/04, 6/04</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **Detailed Action**

The Examiner Note: the previous Office Action has been withdrawn because the Examiner agrees with the Applicants arguments that the Examiner's position that claimed subject matter is not a statutory subject matter was incorrect. The new Office Action is as follows:

### ***Response to Amendment***

Amendment filed on June 8, 2007 has been entered. Claims 2, 18 are canceled. New claim 26 is added. Claims 1, 3-17, and 19-26 are pending in the application. Claims 22-25 are withdrawn from consideration as directed to a non-elected invention.

### ***Claim Objections***

1. Claim 3 is objected to because of the following informalities: "...are intermixed with said ablative material at different thickness with in the thermal protection layer" is advised to be changed to : "...are intermixed with said ablative material at different thickness ~~with~~ in the thermal protection layer".
2. Claims 4-5, and 8-9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 4-5 recite that the intumescent material is *operable* to be applied, and claims 8-9 recite that the ablative composition is *operable* to form a layer. However, each of claims 4-5 depends on claim 3 reciting that the intumescent material is *already* intermixed with the ablative material at different depths; and claims 8-9 depend on claim 1 which recites a formed layer of the ablative.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 3-17, 19-21, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites a phrase “wherein the ablative composition is adapted to form a thermal protection layer for the surface; wherein the intumescent material is intermixed with only a portion of the thickness of a thermal protection layer ablative material”, which is confusing because it is the “ablative composition” that is adapted to form a thermal protection layer not “ablative material”. For examining purposes the phrase was interpreted as “wherein the ablative composition is adapted to form a thermal protection layer for the surface; wherein the intumescent material is intermixed with only a portion of the thickness of the a thermal protection layer ablative material”.

Claim 13 recites “intumescent material ... and *operable* to be applied” in lines 4-5 that contradicts a further statement “ablative layers cooperatively form said ablative composition”. For examining purposes the phrase was interpreted as “intumescent material ... *operable to be* applied”.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Raevsky (US 5206088).

Raevsky discloses an ablative-intumescent system for a thermal protection layer for the surface formed by coating the exposed surface of an ablative material with an intumescent paint (See column 1, lines 59-68). The presence of an intumescent paint coating on the surface of an ablative layer can significantly increase the heat-resistance and insulating characteristics of the ablative material well beyond what might be predicted from the individual characteristics of the ablative layer and the intumescent coating (See column 2, lines 4-20). The ablative materials include commercially available products (See column 2, lines 21-65). The intumescent paint also include commercially available products (See column 2, lines 21-22, 66-67) such as commercially available latex or water based intumescent paints (See column 3, lines 1-4).

As to the intumescent material being intermixed with only a portion of the thickness of a ablative layer, Raevsky teaches that the intumescent paint may be applied onto the ablative layer twice by e.g. *spraying* (See column 3, lines 10-11) with 24 and 48 hours of *drying* at ambient conditions respectively after the first and second applications (See column 3, lines 29-34). Since only the exposed surface of the ablative material is coated with solvent based liquid intumescent

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paint, it is the Examiner's position that with the first spray the liquid intumescent material would penetrate into the ablative material because generally all non-sealed materials are porous to some extent, thereby intermixing with only a portion of the thickness of the ablative layer, as required by Claim 1, and when the intumescent material is sprayed again after drying a coated ablative material, the paint would penetrate into the coated ablative material to less depth, as required by Claim 3, because the coated material would be less porous than uncoated material thereby forming a series of layers with the layers each having a different concentration of the intumescent material mixed therein, as required by Claim 4, with an outermost layer having a maximum concentration of said intumescent material mixed therein, as required by Claim 5.

8. Claims 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raevsky.

Raevsky is applied here for the same reasons as above. Raevsky fails to teach that claimed concentration and thickness (Claims 6-9).

However, one of ordinary skill in the art would easily recognize that the thickness of ablative material and amount of intumescent material would depend on particular materials used and a thermal protection required. The more protection needed the thicker ablative layer and higher concentration of intumescent material would be needed.

It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant concentration and thickness

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parameters (including those of claimed invention) in Raevsky through routine experimentation depending on particular use of a final product in the absence of showing of criticality.

As to claims 10-12, it is the Examiner's position that claimed ablative and intumescent materials are known materials conventionall used in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used claimed ablative and intumescent materials with the expectation of providing the desired thermal protection.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raevsky in view of Deogan et al (US 5,900,281).

Raevsky is applied here for the same reasons as above. Raevsky fails to teach that the intumescent material is ammonium polyphosphate.

Deogan et al teach that well known intumescent-ablative systems containing ammonium polyphosphate as intumescent material swell to produce a char more than five times the original thickness providing superior thermal efficiency (See column 1, lines 57-67; column 2, lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used well known intumescent-ablative systems containing ammonium polyphosphate as intumescent material as a second component in Raevsky with the expectation of providing the desired superior thermal efficiency, as taught by Deogan et al.

10. Claims 11-17, 19-21, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raevsky in view of Tzur (US 4,632,865).

Raevsky is applied here for the same reasons as above.

As to claims 11-12 and 20-21, Raevsky fails to teach that the ablative material comprises a *cork*-based material (Claims 11, 20) or comprises *epoxy* (Claims 12, 21).

Tzur teaches that intumescent-ablator comprising a strong ablator containing cork (See column 3, lines 40-46) or a binder such as **epoxy** resin (See column 19, lines 55-57) combined with an intumescence agent provides better heat insulation properties than either of the systems by itself (See column 2, lines 34-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an ablator containing hydrated inorganic salts, cork or **epoxy** resin in Raevsky since Tzur teaches that a strong ablator containing cork or a binder such as **epoxy** resin combined with an intumescent material is suitable for forming a thermal protection.

As to claim 13, Raevsky fails to teach that intumescent material intermixed with a second quantity the ablative material is applied to the ablative layer.

Tzur teaches that a combination of a strong ablator containing hydrated inorganic salts containing hydrated inorganic salts, cork or **epoxy** resin with an intumescence agent provides better heat insulation properties than either of the systems by itself (See column 2, lines 34-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a strong ablator containing hydrated inorganic salts, cork or **epoxy** resin to form an ablative layer and to have used an intumescent material intermixed with a portion of the strong ablator to form intumescent layers in Raevsky with the expectation of providing the desired better heat insulation properties than either of the systems by itself since Tzur teaches that a combination of a strong ablator containing hydrated inorganic salts containing hydrated



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inorganic salts, cork or **epoxy** resin with an intumescence agent provides better heat insulation properties than either of the systems by itself.

As to claim 14, As was discussed above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant concentration and thickness parameters (including those of claimed invention) in the cited prior art through routine experimentation depending on particular use of a final product in the absence of showing of criticality.

As to claims 19-21, it is the Examiner's position that claimed ablative and intumescent materials are known materials conventionally used in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used claimed ablative and intumescent materials with the expectation of providing the desired thermal protection.

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raevsky in view of Tzur, further in view of Deogan et al.

Raevsky is applied here for the same reasons as above. Raevsky fails to teach that the intumescent material is ammonium polyphosphate.

Deogan et al teach that well known intumescent-ablative systems containing ammonium polyphosphate as intumescent material swell to produce a char more than five times the original thickness providing superior thermal efficiency (See column 1, lines 57-67; column 2, lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used well known intumescent-ablative systems containing ammonium

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polyphosphate as intumescent material as a second component in the cited prior art with the expectation of providing the desired superior thermal efficiency, as taught by Deogan et al.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sawko et al (US 4,088,806) disclose that a conventional intumescent composition composition includes ammonium salt of 1,4-nitroaniline-2-sulfonic acid dispersed in an **epoxy**/polysulfide binder system (See column 3, lines 52-58), combined with an endothermic ablative filler having a decomposition temperature about or within the exothermic region of the intumescent agent (See Abstract; column 3, lines 50-68 to column 4, lines 1-2, 35-38, 50-65; column 5, lines 15-20). The intumescent-ablator coating composition may comprise 20-70 wt % of the intumescent agent (See column 3, lines 67-68), 0.5-2.0 wt % of epoxy polymeric binder (See column 4, lines 1-2), and the ablative filler (See column 5, lines 15-18).

McGinnis et al (US 5,603,990) disclose that it is known in the art to use a composition made by blending water-insoluble *intumescent* agents, including selective salts of nitro aromatic amine compounds such as 4,4'-dinitrosulfanilimide, with **epoxy**-polysulfide or **epoxy**-cholorsulfonated polyethylene binder systems, and with **ablatives** and endothermic tigers, including zinc borate and hydrated endothermic fillers such as aluminum hydroxide pigments to counter an exothermic char-forming reaction effect of the nitro aromatic intumescent species (claimed ablative composition) adapted to form intumescent coatings having good integrity and offering resistance to high humidity (See column 2, lines 59-67 to column 2, lines 1-4).

***Response to Arguments***

13. Applicant's arguments with respect to claims 1, 3-17, 19-21, and 26 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy  
Primary Examiner  
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PRIMARY EXAMINER

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July 14, 2007